JAPAN

EDICT OF GOVERNMENT

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JIS A 0030 (1973) (English): Classification of performance for building elements

安 *The citizens of a nation must honor the laws of the land.* 倂

Fukuzawa Yukichi

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JAPANESE INDUSTRIAL STANDARD

Classification of Performance for Building Elements

JIS A 0030 -1973

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JAPANESE INDUSTRIAL STANDARD

JIS

A 0030-1973

Classification of Performance for Building Elements

1. Scope

This Japanese Industrial Standard specifies classification which is conformed to item performance, measurement and its unit as defined in Table 1, 2, and 3 to indicate performance for building elements (wall, floor, ceiling and roof), and performance mentioned above shall not be included anything concerning structural stress.

2. Item of Performance

Item of performance shall be as shown in Table 1.

Applicable Standards:

JIS A 1304-Method of Fire Resistance Test for Structural Parts of Buildings

JIS A 1321-Testing Method for Incombustibility of Internal Finish Material and Procedure of Buildings

JIS A 1414-Methods of Performance Test of Panels for Building Construction

Table 1

Item of performance	Prescription of item of performance	Remarks
Reflection of light	Value to reflect of light	Performance which is to control each regard factor
Heat insulation	Value to resist of heat transmission in standard temperature	
Sound insulation	Value to insulate of air borne noise	
Insulation of impact sound	Value to insulate of impact sound into room by foot steps	
Sound absorption	Value to absorb sound	
Water proof	Rain water not to penetrate	
Moisture proof	Moisture not to penetrate	
Airtightness	Value to resist against air permeation by difference of barometric pressure	
Resistance to distributed compressive load	Value to resist against force by distributed load of each element	Performance which is concerning on maintenance and safety of building
Resistance to impact stranges	Value to resist against impact stranges	
Resistance to concentrated compressive load	Value to resist against concentrated compressive load	
Abrasion resistance	Value to resist against abrasion	
Fire resistance	Value to resist fire	
Fire retardancy	Value to retard combustion, smoke and poison gas not to generate	
Durability	Value to resist against degeneration and deformation by years	

3. Item and Unit of Measurement

Item and unit of measurement for performance shall be as shown in Table 2.

Table 2

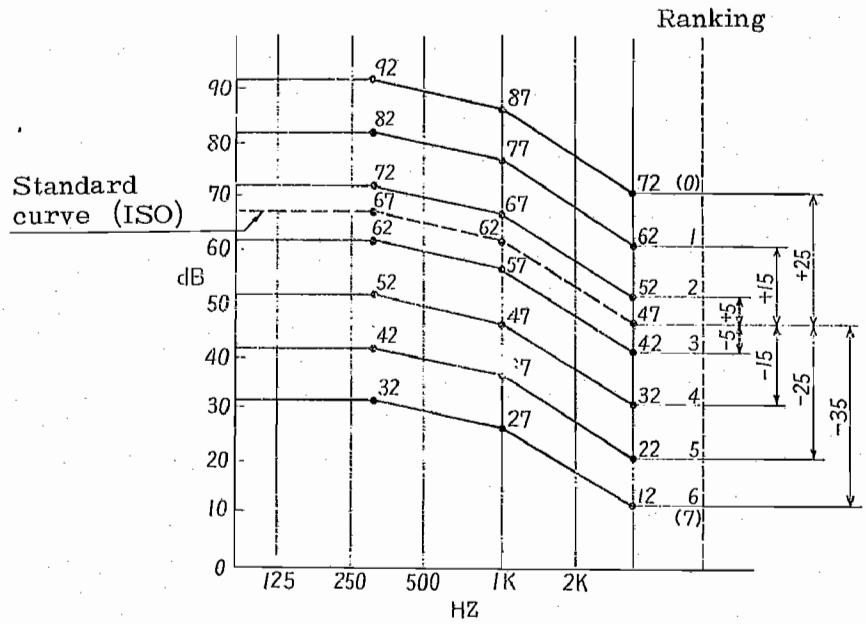
Item of performance	Item of measurement	Unit of measurement	Remarks
Reflection of light	Factor of light reflection	(%)	Diffuse reflection factor to visible ray of 45 degree on incidence (mean of data to each measurement part in testing materials)
Heat insulation	Resistance of heat transmission	$m^2 \cdot h \cdot deg/kcal$	Heat transmission in normal temperature (mean of data)
Sound insulation	Transmission loss	dB	Transmission loss in defined the number of vibration (mean of data)
Insulation of impact sound(1)	Difference of sound pressure level on standard curve	dB	Standard curve of impact sound pressure level to floor
Sound absorpliar	Sound absorbing coefficient	(%)	Sound absorbing coefficient in defined Frequency of vibration (mean of data)
Water proof (water density)	Pressure of water density	kg/m^2	Average pressure in limitance of unleaking, in case of adding average pressure of vibration successively as shown in Table 3, in spraying water with $4\ell/m^2$ min.
Moisture proof	Resistance of moisture permeation	$m^2 \cdot day \cdot mm\ Aq/g$	Opposite number of volume of moisture permeation (mean of data)
Airtightness	Resistance of airtight	m^2h/m^3	Resistance of air permeation unit area in difference pressure in 10 kg/m^2

Item of performance	Item of measurement	Unit of measurement	Remarks
Distributed pressure resistance to distributed compressive load	Unit load	kg/m^2	Minimum ones shall be applied in following loads. 1. Load of maximum deflection, $\ell/100$ 2. Load which is that load of residual deformation, equal to maximum deformation 2.5 % 3. Load which is breaking load x 2/3, load which is not suffered by damage
Impact resistance	Safety impact energy	kg.cm	Critical energy which is not damaged by impact of weight dropping
Local pressure resistance	Concentrated compressive	kg/cm^2	Critical load which is not damaged by load-weight of half ball, dia 25 mm as shown in Table 3
Abrasion resistance	Abrasion loss	mm	Value of abrasion due to 120,000 times of walking by person wearing shoes
Fire resistance	Heating hour of fire resisting	minute	Hours of fire resisting within limitance to resist to heating hours which are defined in JIS A 1304 (Methods of fire resistance test for structural parts of buildings)
Fire retardance	Classification of fire protecting material	—	Classification of fire protecting materials which is defined in Building Standard Law, and these shall be decided by its coefficient of heating and emitting smoke
Durability	Number of years of useful life	year	Number of years which is expected in normal situation

Note ([1]) Performance of insulation of impact sounds shall be classified by the difference of sound pressure level with standard curve by ISO.

Limit of value shall be expressed by the difference with standard curve, then obtained by parallel movement of standard curve into.

Standard Curve (ISO) and the Difference of Sound Pressure Level



4. Classification

(1) Classification of performance shall be as shown in Table 3.

Table 3

Item of performance \ Ranking	(0)	1	2	3	4	5	6	(7)	Remarks: Item of measurement	Remarks: Unit of measurement
Reflection of light	7	10	14	20	28	40	56		Factor of light reflection	(%)
Heat insulation	0.2	0.3	0.5	0.8	1.25	2.0	3.2		Resistance to heat transmission	$m^2 \cdot h \cdot deg/kcal$
Sound insulation	12	20	28	36	44	52	60		Transmission loss	dB
Insulation of impact sound (1)	+25	+15	+5	-5	-15	-25	-35		Difference of sound pressure level on standard curve	dB
Sound absorption	20	30	40	50	60	70	80		Sound absorption coefficient	(%)
Water proof	10	16	25	40	63	100	160		Pressure of water density	kg/m^2
Moisture proof	0.1	1	10	100	250	630	1000		Resistance to moisture permiation	$m^2 \cdot day \cdot mmAq/g$
Airtightness	0.015	0.06	0.25	1.0	4.0	15	60		Resistance to airtightness	m^2h/m^3
Resistance to distributed compressive load	40	71	125	230	400	710	1250		Unit load	kg/m^2
Resistance to impact strength	45	63	160	400	1020	2500	6300		Safety impact energy	kg·cm
Resistance to concentrated compressive load	13	30	80	200	500	1250	3000		Concentrated compressive load	kg/cm^2
Abrasion resistance (2)	3.2	1.8	1.0	0.56	0.32	0.18	0.1		Abrasion loss	mm
Fire resistance	5	10	15	30	60	120	180		Hours of fire resisting	minute
Fire retardancy (3)	—	—	—	—	—	—	—		Classification of fire protecting material	—
Durability	5	8	12	20	32	50	80		Number of years of useful life	year

Notes (2) There is no testing machine to measure abrasion loss of each building element. The figures in Table 3 are shown on the basis of abrasion by walking of 120,000 people.

(3) Classification of fire protecting materials which is defined in Building Standard Law.

Ranking 1st: combustible

Ranking 2nd: semi incombustible

Ranking 3rd: Incombustible

Ranking 4th: between incombustible

Ranking 5th: fire retardancy

(2) Each classification level shall be defined its maximum and minimum limitance by value of performance.

(3) Wording for each classification of performance shall be defined by number of figure.

(4) Figure of number which is exceeded more than number 6 or is less than number 1, shall be equaled to number 7 or number 0.

5. Methods of Test and Measurement

Methods of test and measurement shall be as shown in 5.1 to 5.3

5.1 Fire Resistant JIS A 1304-Method of Fire Resistance Test for Structural Parts of Buildings

5.2 Non-combustible JIS A 1321-Testing Method for Incombustibility of Internal Finish Material and Procedure of Buildings.

5.3 Water Proof JIS A 1414-Methods of Performance Test of Panels for Building Construction.

Remark: Methods of testing, defined by Japanese Industrial Standard at present shall be in JIS A 1304, JIS A 1321 and JIS A 1414 on items of performance which are shown in Table 1 or Table 3. The other performances shall be applied by proper methods of testing which are general carried out until testing standard shall be established.

6. Expression of Performance

6.1 In item of performance, shown in Table 1 and Table 3 in some cases only required items of performance shall be selected and applied. This standard shall not have purpose to be applied to these all performances at any case, besides, in case of having special purpose in item of performance these shall be as shown in Reference Table 1.

6.2 Expression of performance shall be as shown by every method which is shown in (1) to (4) under classification of Table 3, further number 7 and number 0 shall be not required to show maximum and minimum limitances.

(1) Number ~

(2) More than number ~

(3) Less than number ~

(4) Number ~ to number ~

Remark: Examples of transmission loss shall be as shown below.

Number 3: Extent which is from 28 dB to 36 dB in performance value.

More than number 3: Extent which is more than 28 dB in performance value.

Less than number 3: Extent which is less than 36 dB in performance value.

From number 3 to number 5: Extent which is from 28 dB to 52 dB.

7. Mentioned Items of Expression of Classification

Mentioned items in expression of classification of performance for building elements shall be in (1) and (2) as shown below, besides methods of testing and result of testing equally described, and results of testing shall be expressed invariably with unit of measurement.

(1) Item of performance (Title or Name)

(2) Number of figure which is classified by every item of performance.

Reference: Performance for building elements shall be as shown in Reference Table 1. Items of performance which are indicated in Table 1, Table 2 and Table 3 shall be shown on ones which are deliberated generally with principal.

Reference Table 1

Type of performance	Factor	Performance	Item of measurement	Functional requirement
Performance to control factor	Light	Light reflection	Light reflection factor	To be reflexible light
		Gloss		To have gloss
	Sunlight	Sunlight reflection	Sunlight reflection factor	To resist against solar heat
	Heat	Heat transmission	Resistance of heat transmission	To resist of heat transmission in standard temperature
		Heat accumulation	Heat capacity	Little change of temperature
	Sound	Sound transmission	Transmission loss	To protect against sound propagation
		Sound absorption	Absorption coefficient	To absorb sound
		Sound radiation	Impact sound pressure level	Not to transmit tapping sound
		Protection against impact sound	Difference of impact sound pressure level on standard curve	Not to transmit impact noise caused by foot steps
	Water	Protection against water (water proofing)	Water pressure	Not to penetrate rain water
		(Water permeability)		
		(Water absorption)		Not to absorb water
		Water repellence		To repel water
		Drainage		To be drained smoothly
		Protection against moisture	Water vapor resistance	Not to permeate moisture
		Moisture absorption	Amount of moisture absorption per unit	To absorb and radiate moisture

Reference Table 1 (Continued)

Type of performance	Factor	Performance	Item of measurement	Functional requirement
Performance to control factor	Air	Air permeance (permeability to air)	Resistance to air-pressure	To resist against air under the influence of pressure
		Ventilation under roof		To control ventilation under roof
	Vibration	Protection against vibration (vibration proofing)		Not to transmit vibration
	Human matter	Protection against generation of static electricity		Not to charge static electricity
	Radioactive rays	Resistance to radio-active rays	Radioactive rays absorption coefficient	
Performance to be maintained and to be safe from building	External force	Resistance to distributed compressure load	Unit load	To resist against building force by distributed load of each building element
		Stiffness	Permitted stiffness	To be deformed without fatigue
		Resistance to shearing force	Shearing strength	To resist against shearing force
		Resistance to concentrated compressive load	Concentrated compressive load	To resist against local compressive load
		Resistance to scratch		To resist against scratching force
		Resistance to impact strength	Impact energy	To resist against impact strength to be arise by impact

Reference Table 1 (Continued)

Type of performance	Factor	Performance	Item of measurement	Functional requirement
Performance to be maintained and to be safe from building		Wear resistance	Abrasion loss	To resist against wear
	Heat	Resistance to vibration		To resist against vibration
		Heat resistance-highest service temperature		To resist against change in quality, deformation and destruction by high temperature
		Heat resistance-lowest service temperature		To resist against change in quality, deformation, and distribution by low temperature
	Water	Resistance to water		To resist against change in quality, deformation, and destruction by water
		Moisture resistance		To resist against change in quality, deformation, and destruction by moisture
	Chemicals	Effect of chemicals		① To resist against change in quality & deformation by oils ② To resist against change in quality and deformation by acids and alkalis ③ To resist against change in quality and deformation by alcohol ④ To resist against change in quality and deformation by salts ⑤ To resist against change in quality and deformation by other harmful chemicals

Reference Table 1 (Continued)

Type of performance	Factor	Performance	Item of measurement	Functional requirement
Performance to be maintained and to be safe from building	Fire	Fire resistance	Heating hours	To resist against fire
		Incombustibility	Types of material for fire proofing	To be incombustibility and smoke and harmful gases not to generate
		Resistance to flash over of fire and catch fire	Flash point and catch fire point	Not to flash over and catch fire
	Ultraviolet ray	Resistance to ultra-violet ray		To resist against change in quality by ultraviolet ray
	Dust	Contamination by dust		① Not to stick contamination by dust easily ② Contamination by dust not to be noticeable ③ Easy removal of contamination by dust
	Vermin	Vermin resistance		Not to be caused damage by vermin and not suitable for growth of vermin
	Rat	Resistance to rat		Not to be damage by action of rat
	Fungus and bacteria	Fungi resistance		Not to be caused by fungus and bacteria
	Life time	Durability	Life time	To resist against change in quality and deformation by life time

Reference Table 1 (Continued)

Type of performance	Factor	Performance	Item of measurement	Functional requirement
Performance relating to human feeling and action	(To touch)	Agreeableness of touch		Touch and texture to be comfortable (1) Hard and soft (2) Smooth and rough (3) Warm and cold
		Injury		Human to be able to act safely
	Human matter	Degree of damage		Not to damage dropped goods
	(To walk)	Degree of slipperiness in use		Not to be slipperiness
	(To look)	Appearance		To feel comfortable (1) Color (2) Volume (3) Pattern, texture (4) Gloss (5) Form, dimension
	Human	Protection to vibration		Not to feel uncomfortable by vibration

Remark: Operation factors in parentheses indicate human being's action or feeling.